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PCT/EP2003/012322



Translation

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

|   |   |   |
|---|---|---|
| Applicant's or agent's file reference<br>B02/0037PC                                       | <b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) |   |
| International application No.<br>PCT/EP2003/012322  | International filing date (day/month/year)<br>05 November 2003 (05.11.2003)   | Priority date (day/month/year)<br>05 November 2002 (05.11.2002) |
| International Patent Classification (IPC) or national classification and IPC<br>C12P 7/62 |   |   |
| Applicant<br>BASF COATINGS AG   |   |   |

- This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 6 sheets, including this cover sheet.  
  
☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).  
 These annexes consist of a total of                      sheets.

- This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

|   |   |
|---|---|
| Date of submission of the demand<br>02 June 2004 (02.06.2004) | Date of completion of this report<br>24 January 2005 (24.01.2005) |
| Name and mailing address of the IPEA/EP                       | Authorized officer  |
| Facsimile No.   | Telephone No.   |

Form PCT/IPEA/409 (cover sheet) (July 1998)

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## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/EP2003/012322

## I. Basis of the report

## 1. With regard to the elements of the international application:\*

- ☐ the international application as originally filed
- ☒ the description:  
 pages \_\_\_\_\_ 1-17 \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☒ the claims:  
 pages \_\_\_\_\_ 1-12 \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, as amended (together with any statement under Article 19  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the drawings:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the sequence listing part of the description:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

## 2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

## 3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/fig \_\_\_\_\_

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

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## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

|                               |        |      |     |
|-------------------------------|--------|------|-----|
| Novelty (N)                   | Claims | 1-12 | YES |
|                               | Claims |      | NO  |
| Inventive step (IS)           | Claims | 1-12 | YES |
|                               | Claims |      | NO  |
| Industrial applicability (IA) | Claims | 1-12 | YES |
|                               | Claims |      | NO  |

## 2. Citations and explanations

1. The international search report citations are designated by the following abbreviations:

D1: EP-A-0 999 230 (GOLDSCHMIDT AG TH) 10 May 2000  
(2000-05-10)

D2: EP-A-0 999 229 (GOLDSCHMIDT AG TH) 10 May 2000  
(2000-05-10)

D3: TOR R ET AL: "ENZYMATICALLY CATALYSED  
TRANSESTERIFICATIONS OF ACRYL AND METHACRYL  
MONOMERIC ESTERS" ENZYME AND MICROBIAL  
TECHNOLOGY, STONEHAM, MA, US, Vol. 12, April  
1990 (1990-04), pages 299-304, XP000910508  
ISSN: 0141-0229

D4: PAVEL K ET AL: "ENZYMES IN POLYMER CHEMISTRY"  
POLYMER BULLETIN, SPRINGER VERLAG. HEIDELBERG,  
DE, Vol. 21, No. 5, 1 May 1989 (1989-05-01),  
pages 535-540, XP000051853 ISSN: 0170-0839

D5: WO 01/46286 A (STEINRUECKEN ROLAND; BAUMGART  
HUBERT (DE); MEISENBURG UWE (DE); PRIET)  
28 June 2001 (2001-06-28)

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2. Claims 1 to 7 of the present application concern a method of producing poly(meth)acrylates that can be cured by actinic radiation or are dual cured, the method involving two-steps:

1. production of a poly(meth)acrylate containing OH side chains from components A ((meth) acrylate) and B (OH-alkyl(meth)acrylate) and optionally components C and D;

2. transesterification or esterification of the poly(meth)acrylate comprising the OH side chains with (meth)acrylate or (meth)acrylic acid using an enzyme.

Claims 8 to 12 concern the compounds produced by this method and the use of these compounds as top coats.

3. Brief discussion of the prior art documents

D1 and D2 disclose the same reaction principle as the present application: hydroxy-functional polymers (siloxane derivatives) (D1) and polyoxyalkylenes (D2) are reacted with (meth)acrylic acid (ester) in the presence of an enzyme (lipase), resulting in radiation-curable polymers. The difference from the present application is that no poly(meth)acrylates having hydroxy-functional side chains are used.

D3 describes in general the use of enzymes as being important in transesterification reactions of (meth)acrylic acid (esters), but no polymers are used as hydroxy component.

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D4 describes the use of enzymes in polymer chemistry in the lipase-catalysed acetylation of methacrylic polymers in the presence of vinyl acetate.

D5 discloses isocyanate as component A and OH-group-containing (meth)acrylic polymer as component B, resulting in coating substances which can be cured by actinic radiation and heat. No enzyme is mentioned.

4. Novelty (PCT Article 33(1) and (2)):

Claims 1 to 7:

The method claimed in these claims appears to be novel in light of D1 to D5 since the compounds described in those documents are structurally different from those claimed in the application and do not use any enzymes.

Claims 8 to 12:

The description of the present application (see pages 1 and 2) states that UV- and dual-curable poly(meth)acrylates are known but these prior art polyacrylates are structurally different from those claimed and produced in the present application (secondary hydroxyl group near the acyloyl group).

Compounds defined in terms of products-by-process are considered, at least by the EPO, to be novel only when they differ clearly and in a reproducible manner from the prior art. Since the prior art does not disclose any method in which such compounds could be produced or are described, the claimed compounds and thus their use also appear to be novel.

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5. Inventive step (PCT Article 33(1) and (3)):Claims 1 to 7:

The problem addressed by the present application was that of producing poly(meth)acrylates which can be cured by actinic radiation and/or are dual curable. This problem is solved by the enzymatic method described in claims 1 to 7.

In light of the prior art, it is unexpected that a reaction of poly(meth)acrylates comprising hydroxy-functional side chains with (meth)acrylate or (meth)acrylic acid in the presence of an enzyme is possible since these enzymes also catalyse hydrolysis and the claimed compounds contain a hydrolysable ester group.

Therefore an inventive step can be recognized in the unexpected fact that the transesterification or esterification in the claimed method is chemoselective.

Claims 8 to 12:

Neither the structure, production methods or use of the compounds as claimed in claims 8 to 12 are known from the prior art. Since these compounds could not previously be produced and have the structural advantage that they exhibit no discoloration, an inventive step can also be recognized for claims 8 to 12.

6. Industrial applicability (PCT Article 33(4)):

The subject matter of claims 1 to 12 has industrial applicability.

## PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

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| B1  |  |
| B2  |  |
| B3  |  |
| SEK |  |
| EDV |  |
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NOTIFICATION OF TRANSMITTAL  
OF COPIES OF TRANSLATION  
OF THE INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY  
(CHAPTER I OR CHAPTER II  
OF THE PATENT COOPERATION TREATY)  
(PCT Rule 72.2)

To:

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Wichmann | Patentanwälte  
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15. Juni 2005

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Date of mailing (day/month/year)  
09 June 2005 (09.06.2005)

Applicant's or agent's file reference  
B02/0037PC

## IMPORTANT NOTIFICATION

International application No.  
PCT/EP2003/012322

International filing date (day/month/year)  
05 November 2003 (05.11.2003)

Applicant

BASF COATINGS AG et al

## 1. Transmittal of the translation to the applicant.

The International Bureau transmits herewith a copy of the English translation made by the International Bureau of the international preliminary examination report established by the International Preliminary Examining Authority.

## 2. Transmittal of the copy of the translation to the elected Offices.

The International Bureau notifies the applicant that copies of that translation have been transmitted to the following elected Offices requiring such translation:

AZ, CA, CH, CN, CO, GH, KG, KP, KR, MK, MZ, RU, TM

The following elected Offices, having waived the requirement for such a transmittal at this time, will receive copies of that translation from the International Bureau only upon their request:

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## 3. Reminder regarding translation into (one of) the official language(s) of the elected Office(s).

The applicant is reminded that, where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report.

It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned (Rule 74.1). See Volume II of the PCT Applicant's Guide for further details.

The International Bureau of WIPO  
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Authorized officer

Ellen Moyse